CLAIMS

1. An electrical machine of the transversal-flux type, comprising

- a stator (1) comprising a plurality of stator elements (9, 10) with magnetic flux conductors (21-24) and an electric conductor forming a winding (11) extending in an essentially closed winding path through each magnetic flux conductor (9, 10), and
- a movable element (2) which comprises a number of permanent-magnet members (15) and which is movable in relation to the stator (1) along a movement path,

wherein the essentially closed winding path (11) comprises a first current-carrying section (12) extending essentially along the movement path,

wherein each magnetic flux conductor (21, 23) is adapted to form, together with one of said permanent-magnet members (15), a closed magnetic flux circuit (25) extending around said current-carrying section (12),

wherein each permanent-magnet member (15) comprises a primary magnet (16) that has a north pole and a south pole and a magnetic direction extending from the south pole to the north pole and essentially across the movement path, and

wherein the permanent-magnet members (15) are arranged in an alternating order in the movable element with respect to the magnetic direction of the primary magnet (16),

characterized in that adjacent permanent-magnet members (15) of the movable element (2) are separated from each other by an intermediate member (40) comprising at least one secondary magnet (41, 42) which has a north pole and a south pole and a magnetic direction extending from the south pole to the north pole and essentially across the magnetic direction of the primary magnet (16).

2. An electrical machine according to claim 1, **characterized** in that the magnetic direction of the secondary magnet (41, 42) extends essentially parallel to the movement path.

3. An electrical machine according to claim 2, **characterized** in that each intermediate member (40) of the movable element (2) comprises two secondary magnets (41, 42).

4. An electrical machine according to claim 3, **characterized** in that secondary magnets (41, 42) of an intermediate member (40) between first and second adjacent permanent-magnet members (15) are arranged in such a way that the first secondary magnet (41) is in the vicinity of the north pole of the primary magnet (16) of the first permanent-magnet member and the south pole of the primary magnet (16) of the second permanent-magnet member (42) and so that the second secondary magnet (42) is in the vicinity of the south pole of the primary magnet (16) of the first permanent-magnet member and the north pole of the primary magnet (16) of the second permanent-magnet member.

5. An electrical machine according to any of claims 3 and 4, **characterized** in that each intermediate member (40) of the movable element comprises a layer (50) of a magnetically insulating material outside the two secondary magnets (41, 42).

6. An electrical machine according to any of claims 3 and 4, **characterized** in that each permanent-magnet member (15) comprises a first magnetic flux conductor (43) on one side of the primary magnet (16) and a second magnetic flux conductor (44) on the other side of the primary magnet (16).

7. An electrical machine according to claims 3 and 6, **characterized** in that the secondary magnets (41, 42) of an intermediate member (40) between two adjacent permanent-magnet members (15) are arranged in such a way that the first secondary magnet (41) extends between said first magnetic flux conductor (43) of the two permanent-magnet members (15) and so that the second secondary magnet (42) extends between said second magnetic flux conductor (44) of the two permanent-magnet members (15).

8. An electrical machine according to any of the preceding claims, **characterized** in that the magnetic direction of said secondary magnet (41, 42) is essentially perpendicular in relation to the magnetic direction of the primary magnets (16).

9. An electrical machine according to any of the preceding claims, **characterized** in that each magnetic flux circuit (25) comprises a magnetic flux that is parallel to a plane which is essentially perpendicular to the movement path.

10. An electrical machine according to any of the preceding claims, **characterized** in that the distance between a centre of adjacent permanent-magnet members (16) is essentially equal to the distance between a centre of adjacent magnetic flux conductors (21-24) of the stator (1).

11. An electrical machine according to any of the preceding claims, **characterized** in that the magnetic flux conductors (21-24) of the stator are arranged in an alternating order with respect to the direction of the magnetic flux in relation to the permanent-magnet members (15) in the respective magnetic flux circuit (25).

12. An electrical machine according to any of the preceding claims, **characterized** in that the essentially closed winding path comprises a second current-carrying section (13) extending essentially parallel to the movement path.

13. An electrical machine according claim 12, **characterized** in that the first current-carrying section (12) of the winding path is associated with essentially a first half of the magnetic flux conductors (21, 23) of the stator (1) and the second current-carrying section (13) of the winding path is associated with essentially a second half of the magnetic flux conductors (22, 24) of the stator (1).

14. An electrical machine according claim 13, **characterized** in that the permanent-magnet members (15) of the movable

element are adapted to cooperate with those magnetic flux conductors (21, 23) of the stator which are associated with the first current-carrying section (12), and those magnetic flux conductors (22, 24) of the stator (1) which are associated with the second current-carrying section (13).

15. An electrical machine according to any of the preceding claims, **characterized** in that each magnetic flux conductor (21-24) comprises at least one magnetic flux-conducting section (26), wherein said sections of each magnetic flux conductor are arranged in a line one after the other which is parallel to the movement path, wherein the magnetic flux of said section (26) of each magnetic flux conductor (21-24) extends in essentially the same direction and wherein a dividing member (30) is arranged between each pair of adjacent magnetic flux conductors (21-24) and comprises main sections which comprise a magnetically conducting material and which extend along said section (26).

16. An electrical machine according to claim 15, **characterized** in that said sections (26) form a magnetic flux-conducting central section.

17. An electrical machine according to claim 16, **characterized** in that each a magnetic flux conductor (21-24) comprises at least said central section (26) and two magnetic flux-conducting end sections (27, 28).

18. An electrical machine according to claim 17, **characterized** in that each dividing member (30) is magnetically insulating along the end sections (27, 28).

19. An electrical machine according to claim 18, **characterized** in that each dividing member (30) forms a space with air along the end sections (27, 28).

20. An electrical machine according to any of the preceding claims, **characterized** in that the main section of said dividing member (30) is made of a magnetically conducting iron.

21. An electrical machine according to any of the preceding claims, **characterized** in that the two end sections (27, 28) of each magnetic flux conductor (21-24) are displaced in a plane essentially perpendicular to the movement path in relation to the end sections (27, 28) of each adjacent magnetic flux conductor (21-24).

22. An electrical machine according to any of the preceding claims, **characterized** in that the movable element (2) is adapted to carry out a reciprocating motion.

23. An electrical machine according to claim 22, **characterized** in that the movable element (2) is connected to at least one piston (76) that is movably arranged in a housing (75).

24. An electrical machine according to claim 23, **characterized** in that the electrical machine (3) is adapted to cooperate with a combustion engine, whereby said housing (75) forms a combustion chamber (77) in which the piston (76) is movable back and forth.

25. An electrical machine according to any of claims 1 to 21, **characterized** in that the movable element (2) is adapted to carry out a rotating movement.

26. Use of the electrical machine (3, 4) according to any of claims 1 to 22 and 25 as a generator for generating electric power.

27. Use according to claim 26, wherein said generator is adapted to constitute a component in one of a wind power plant and a wave power plant.

28. Use of the electrical machine (3, 4) according to any of claims 1 to 22 and 25 as a motor for generating mechanical power.

29. Use according to claim 28, wherein said motor is adapted to form a drive motor (4) in a vehicle (93).